IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Otto Preiss et al.

Application No.: 09/698,234

Filed: October 30, 2000

For: INTEGRATION OF A FIELD DEVICE IN AN INSTALLATION CONTROL SYSTEM

Group Art Unit: 2121

Examiner: Crystal J. Barnes

Confirmation No.: 6329

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action mailed January 21, 2004, reconsideration and allowance of the present application are respectfully requested. Claims 2-9, 11 and 14-24 remain pending in the application. Claims 1, 10 and 12-13 have been canceled. Claims 21-22 are the sole independent claims pending.

On pages 3-4 of the Office Action, independent claims 21 and 22 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,059,439 (Besnard) or U.S. Patent No. 6,298,377 (Hartikainen et al). Independent claims 21 and 22 are also rejected under 35 U.S.C. §102(a) as being anticipated by U.S. Patent No. 6,618,745 (Christensen et al).

In numbered paragraph 13 on page 7 of the Office Action, independent claims 21 and 22 are included in a rejection under 35 U.S.C. §103 as being unpatentable over newly cited U.S. Patent No. 6,615,088 (Myer et al). Because the Myer patent is a newly cited reference, and because claims 21-22 correspond to original claims 1

and 10, the finality of the present application is respectfully traversed, and reconsideration of the finality is requested. Claims 1 and 10 had previously been amended to include subject matter indicated by the Examiner as allowable. Claims 1 and 10 were then rewritten in their original form as claims 21-22 following the Examiner's withdrawal of the indication of allowability. The Examiner's reliance on the newly cited art to Myer is therefore inappropriate in a Final Office Action.

Various dependent claims are rejected throughout the Office Action based on the aforementioned documents, and the previously cited U.S. Patent No. 5,960,214 (Sharpe, Jr.). For example, claims 5 and 11 were rejected under 35 U.S.C. §103 as being unpatentable over the Hartikainen patent in numbered paragraph 10 of the Office Action; in numbered paragraph 11, claims 2-9, 11 and 14-20 were rejected as unpatentable over the Sharpe patent; in numbered paragraph 12, claims 9 and 20 were rejected as being unpatentable over the Christensen patent, and in numbered paragraph 13, dependent claims 2-9, 11, 14-20 and 23-24 were rejected, along with the independent claims, based on the Myer patent.

All of the foregoing rejections are respectfully traversed, as independent claims 21-22 recite features neither taught nor suggested by any of the documents relied upon by the Examiner. For example, none of the documents relied upon by the Examiner are directed to integration of a field device in an installation control system. None of the documents relied upon by the Examiner, considered individually or in combination, are therefore directed to the transmission, by a field device, of a functional description of its device functions to a control station as recited in claim 21. None of the documents relied upon by the Examiner, considered alone or in combination, teach or suggest installing functions of a field device on a

control station, or configuring communication links between device functions and functions of a control station.

To the contrary, the patents to Besnard, Hartikainen and Christensen are not even directed to installation process, but are directed to operation of a configured system. Similarly, the Sharpe patent is directed to an organization of dataflow, and not to an installation process for integration of field devices into an installation system. The newly cited Myer patent, appears to be the closest art relied upon by the Examiner, as it is directed to a system setup operation. However, the Myer patent is not directed to industrial installations which involve field devices and communication links with field devices. As such, none of the patents relied upon by the Examiner teach or suggest features recited in independent claims 21 and 22. Distinctions of the presently claimed invention relative to the documents relied upon by the Examiner will be discussed in greater detail.

The present invention is generally directed to a method and system for integration of a field device in an installation control system, such as a high-voltage or medium voltage substation controlled by a distributed installation control system of field devices interconnected by communications links. Exemplary embodiments include a substation or switch gear assembly controlled by a distributed installation control system from field devices connected to one another via a number of communications buses. An exemplary method or control system as claimed is adapted for **integration** of a new field device into the control system. That is, exemplary embodiments are directed to the adding of a field device to the control system by connecting it to a communications network represented by the

communication buses, such as the communications buses 3 and 5 of Applicants' Figure 1.

As described on Applicants' specification page 8 beginning with line 17, a control station, such as control station 2 of the Figure 2 installation control system, includes an engineering application 21 for integration of field devices 1 and for commissioning of the installation. As described on Applicants' specification page 17 beginning with line *15,* during operation of the installation, following the integration, the engineering application is no longer required.

In accordance with exemplary embodiments, the integration of a field device in a control system is performed by a process which includes transmitting, from the field device to the control station, a functional description of the field device in a standardized form. Applicants' specification pages 9-10 provide an exemplary functional description as a "Substation Configuration Language (SCL)". The content of the functional description, including addresses, type of device functions, and so forth, enables the installing of functions associated with the field device on the control station, and the configuring of communications links between the field device functions and the control station functions. Transmission of the functional description can be performed without a communication link having been set up before hand, but rather can be based on a registry service as described, for example, on Applicants' specification page 8, beginning with line 34.

Following transmission of the functional description from the field device, functions associated with the field device can be installed on the control station. This installing function can be performed by the engineering application, which instantiates (that is, creates and assigns) associated functions, such as graphical

representations, at the control station. The installing function is described, for example, at specification age 12, beginning with line 31.

Communication links are configured between the device functions and the control station functions. The communication links can include logical (e.g., addresses) and physical (e.g., parameter format) information about the data exchange as discussed on specification page 2 beginning with line 6. The physical information or communication parameters are related to the standardized functional description transmitted by the field device. This enables the data exchange not only with the field devices, but with their device functions or services.

Exemplary embodiments for integrating a new field device in an installation control system provides significant advantages. For example, detailed logic links and communication parameters need not be specified in a planning phase preceding realization of an installation, such as a switch gear assembly to be controlled by the field devices. In addition, installed functions of the control station and configured communication links between control station functions and field device functions can be associated to elements of the installation without manual intervention in a manner as described at specification page 5, paragraph 3.

The foregoing features and advantages are broadly encompassed by Applicants' independent claims 21 and 22. For example, claim 21 is directed to a method for integration of a field device in an installation control system, wherein the installation control system has a communications network and a control section. The claim 21 method comprises transmitting, by the field device, a functional description of its device functions to the control station in a standardized form. The claim 21 method also recites installing functions associated with the field device on the control

station; and configuring communications links between the device functions and functions of the control station. Such a combination of features is neither taught nor suggested by the documents relied upon by the Examiner.

As already mentioned, the Besnard, Hartikainen and Christensen patents are not directed to a setup operation for integration of a field device in an installation control system. The Besnard patent is directed to acquisition of information from sensors in a building using a supervision unit. Acquisition of information is described, for example, at column 2, beginning line 44. The acquisition is performed by microprocessor 19 which is part of I/O device 12. Information is acquired during operation of the system by sensors 13. However, the Besnard patent is not directed to a field device which transmits a functional description of its device functions to a control station in a standardized form. Besnard does not teach or suggest installation functions associated with the field device on a control station, or configuration of communications links between device functions and functions of the control station. As such, the Besnard patent fails to teach or suggest Applicants' invention as set forth in independent claims 21-22.

The Hartikainen patent is also directed to a collection of data using intelligent devices via protocol-specific field communication interfaces. Again, this patent is not directed to integration of a field device into an installation control system. As such, this patent fails to teach or suggest the aforementioned features of independent claims 21 and 22.

The Christensen patent is directed to a communication gateway between smart devices and a controller as described at column 2, beginning with line 43. Again, the patent is directed to a discussion of normal system operation, as opposed

to system setup. The system as disclosed is directed to coordinating communications of already connected devices using a connection manager 110. However, the patent does not teach or suggest integration of a field device, or installation of functions associated with a field device. In addition, this patent does not teach or suggest transmitting a functional description of field device functions to a control station in a standardized form, but rather is directed to typical communications across a databus 30 as described at column 6, beginning with line 43.

The Christensen patent also fails to teach or suggest configuring communications links between field device functions and functions of a control station. This patent is merely directed to services, formats and behaviors used to build messages as described at column 6, lines 40-47 (as opposed to directing messages to a destination). As such, the Christensen patent fails to teach or suggest the features recited in Applicants' independent claims 21 and 22.

The Sharpe patent is directed to a field device management system. However, this patent is merely directed to an organization of dataflow during normal operation, and not to the setup operation by which devices can be integrated into an installation system. As such, the Sharpe patent provides no teaching or suggestion for transmitting a functional description of field device functions to a control station **upon integration** of the field device into an installation control system. In addition, the Sharpe patent provides no teaching or suggestion for **configuring** communication links between device functions of a field device to be integrated into an installation control system and functions of a control station.

The Sharpe system discloses a management system 10 in Figure 1, which is connected with a process 12 that includes smart field devices 16, 18, 20 and 22. Figure 2 illustrates the management system in greater detail as including a device server 68, a smart device communication interface 74 and a Device Description Server (DDS) 72 for interfacing with each smart device, such as smart device 12 in Figure 2. Referring to the Abstract of the Sharpe patent, the interface is described as providing communication for accessing information from and/or writing information to a smart field device, such as the smart field device 12. An object of the Sharpe patent is to avoid new programming when a new smart device is added, as discussed at column *5,* line 2. However, the Sharpe patent provides no teaching or suggestion as to procedures to be implemented upon addition of a field device to an existing management system. Rather, the Sharpe patent is directed to the organization of dataflow in an existing management system, and is not directed to setting up the system.

In operation, the Sharpe system retrieves data from one of the on-line devices, such as smart device 12, in a manner as described at column 11, beginning with line 7. A command is sent to the smart device communication interface 74 of Figure 2, which sends a request to the DDS 72 for information on how to retrieve data and/or how to interpret the data. In response, "instruction information" for the data retrieval operation is obtained from the device description server and returned to the communication interface 74. The interface 74 uses this information to address the smart device 12. The smart device then responds with data streaming that includes the requested data.

The instruction information obtained from the device description server (DDS) 72 by the interface 74 appears to constitute logical and physical information behind the communications links, and it allows the server 68, via the communication interface 74, to access data from the smart device 12. Column 3, beginning with line 15 describes the DDS as a library of routines which can interpret the device description of a smart device to provide information pertaining to the smart device such as: set up and configuration of the smart device; communication with the smart device; user interfaces; and methods for using conjunction with the smart device.

However, the Sharpe patent does not teach or suggest the manner by which the "instruction information" is supplied to the device description server. That is, there is no teaching or suggestion in the Sharpe patent for **configuring** communications links between device functions associated with the smart device, and functions of a control station. The Office Action does not address these shortcomings of the system disclosed in the Sharpe patent.

The Examiner appears to correlate the claim feature of "configuring communications links" with the communication line 42 of Figure 1 in the Sharpe patent. However, the communication line 42 in the Shape patent is a physical line that connects the smart devices to a modem (see, for example, column 6, line 42 of the Sharpe patent). However, the mere indication of a physical communication line does not constitute a configuring of a communication link between device functions and functions of a control station, which is substantially more involved than merely providing the indication of the existence of a physical communication line.

In addition, the Sharpe patent does not teach or suggest the transmitting, by a field device, a functional description of its device functions to a control station. The

Examiner appears to refer to "device related information" as representing the functional description recited in claim 1 (see, for example, the last paragraph on page 3 of the Office Action). However, the information referred to by the Examiner can, according to the Sharpe patent, be provided either by the smart devices, or as described in column 6 beginning with line 27, can be stored in a database. Hence, the device related information cannot be considered to correspond to the functional description information which is necessarily transmitted by a field device upon integration of the field device into an installation.

Thus, the Sharpe patent fails to teach or suggest Applicants' method as recited in claim 21. Applicants' claim 22 is directed to an installation control system which contains structural elements for performing functions similar to those described with respect to the claim 21 method. Thus, for reasons similar to those discussed above with respect to claim 21, claim 22 is also allowable over the Sharpe patent.

The Myer patent discloses a household system having master controller 36 which serves as a relay between appliances (such as a CD player, TV or microwave oven), and the Internet, as shown in Figure 2. The various appliances can include their own configuration files which are uploaded to the master controller 36 when the appliance is brought on line, as described at column 5, between with line 38. Instances, or objects 106-110, are instantiated to allow the master controller 36 to communicate with the appliances as described at column 5, between with line 40.

However, the appliances described in the Myer patent are controlled via device drivers of the master controller 36 directly, and there are no field devices or communications links as recited in Applicants' independent claims 21-22. One

skilled in the art would not have been motivated to modify the Myer patent to include such features because this patent is not directed to an industrial installation which includes field devices between a control station and end devices (e.g., a high voltage switch gear assembly) which are also controlled by the field devices.

All of the remaining claims depend from claims 21 and 22, and recite additional advantageous features which are neither taught nor suggested by the documents relied upon by the Examiner. For example, claim 2 recites that the control station contains information about a structure of an installation. Such a structure corresponds to a physical arrangement of elements or primary units of an installation, such as the circuit breakers of a switch gear assembly.

All rejections and objections raised in the Office Action having been addressed, it is respectfully submitted that all of the pending claims are in condition for allowance. However, should there be any remaining questions, it is respectfully requested that the undersigned be contacted at the number shown below.

Respectfully submitted,

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